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Information Availability in Acquisition Decisions: The Role of Prior Relations and Rival Bidders

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ABSTRACT: This study uses detailed survey data from key decision makers in acquiring firms to test the impact of information availability in corporate acquisitions on pre-acquisition valuation and post-acquisition performance. Our results provide support for the hypothesis that information constraints at the time of target valuation are associated with greater overpayment and weaker post-acquisition performance. Prior ties between firms are found to reduce information constraints to acquiring managers, and thereby reduce overpayment and increase post-acquisition performance. Bids by other potential acquirers are found to signal their private information about the target, providing a substitute for lacking information. This effect holds particularly for non-financial data, which are harder to obtain. These findings suggest that overpayment and underperformance can be prevented not only when an acquirer possesses more information, but also when in the absence of needed information, the presence of rival bidders signals their private information about the value of the target.

Keywords: corporate acquisitions; valuation; information availability; rival bidders; prior relations.

I. INTRODUCTION

Corporate acquisitions can be an important source of value creation for successful acquirers, but only if the price paid is less than the intrinsic value of the target plus any realized synergies (Andrade, Mitchell, and Stafford 2001). Target firms create value for their shareholders when they are acquired for a price above their intrinsic value. When synergies are realizable, a mutually beneficial deal between both parties is possible. However, in dividing the gains from potential synergies between both parties, target firms are at a considerable advantage as they have more information about their intrinsic value and possibly also about the potential for synergies (Martin and Shalev 2017; Officer, Poulsen, and Stegemoller 2009).

Valuing firms available for acquisition is a complex process. Information is unevenly distributed, not only between acquirers and targets, but between different potential acquirers as well. Information on potential target firms can be obtained from public sources, such as financial statements and press releases (McNichols and Stubben 2015; Raman, Shivakumar, and Tamayo 2013). This information can be considered to be relatively uniformly distributed throughout the market and between

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potential acquirers. However, other sources of information are only available to particular firms or even particular individuals (Capron and Shen 2007). This type of private information is valuable as it puts one at an advantage compared to other potential acquirers and can reduce a target's informational advantage. Particularly in the situation when a target is private and no listed price is available on which to anchor, valuation can vary considerably and can be strongly influenced by private information. Similarly, when no regular buying or selling of stock takes place, bids by other parties can carry an important signal about a target's intrinsic value.

While prior research has established the impacts of information constraints and the quality of publicly available information on target valuation, there has been less consideration of the effects of alternative sources of information about the target. This study aims to address this gap. Particularly, we examine the impact of information availability on the evaluation of the price paid and on post-acquisition performance, as well as the informational impacts of prior relations between acquirer and target, and of the presence of rival bidders.

Prior relations between acquirers and targets (such as through strategic alliances or buyer-supplier relations) can be an important source of information for management of the acquiring firm (Zaheer, Hernandez, and Banerjee 2010). Prior joint activities and contact between firms can reduce both relational and performance risk in alliances (Langfield-Smith 2008). Sometimes, pre-acquisition alliances are entered into as a form of due diligence with the intent to "pre-test" and subsequently complete an acquisition. Other forms of contact between firms prior to an acquisition can also impact the acquisition dynamics. Indeed, theoretical studies have considered successful cooperation as a positive signal and as a predictor for successful acquisitions (Arend 2004). We more directly examine the effect of prior ties on information availability, an effect that is assumed in previous studies on the relationship between prior ties, uncertainty reduction, and acquisition performance. We hypothesize that one way in which prior ties influence success is by increasing information availability for target valuation, which in turn reduces acquisition overpayment and increases post-acquisition performance.

Another potential factor impacting decisions are bids from rival bidders. In contrast to prior ties, which provide management with information before the bidding process, rival bidders influence the information environment during this process. Through the tendering of a bid for a target firm, potential acquirers signal their beliefs about the target's value. Particularly in situations where potential acquirers lack information needed for valuation of a target, bids from rival firms can provide credible valuation signals, especially if the missing information is likely to be held by other bidders. Such bids can reduce uncertainty for the management of the acquiring firm and we therefore hypothesize that rival bidders weaken the impact of an information gap on acquisition overpayment.

To test these hypotheses, we use detailed survey data collected from key decision makers in acquiring firms in Belgium and The Netherlands. The decision-making process, in which information and signals are considered, takes place at the top management level of the acquiring firm and we collected detailed data at this level. We targeted specific acquisitions by these firms, and for each identified and surveyed, the primary person responsible for the acquisition decision. This process allowed us to elicit detailed information directly from key decision makers in 77 acquisitions, most often the chief executive officer (CEO) or chief financial officer (CFO). Most acquisitions are of private, unlisted target firms, for which information availability is not as regulated and standardized, as well as being more constrained.

Our findings show that when information availability is low (i.e., the presence of an information gap), acquirers tend to overpay more for targets and the resulting mergers are on average less successful. We find that prior ties with target firms are one way in which acquirers can enhance information availability for target valuation and acquisition decisions. We also obtained strong evidence that the presence of rival bidders helps acquiring firms in reducing uncertainty in the bidding process. Acquirers indicate less overpayment and greater post-acquisition performance when there are rival bidders involved in the process, while the negative influence of an information gap on target overpayment and post-acquisition performance is also weaker when rival bidders are involved. This holds in particular when there is a gap in non-financial information, which, as compared to financial information, is less likely to be equally distributed between bidders.

This paper contributes to the literature in several ways. Prior archival studies have shown that the quality of publicly available accounting information of listed firms is associated with acquisition performance (McNichols and Stubben 2015). This study assembles detailed information of primarily unlisted firms as provided directly by decision makers, providing support for and extending earlier archival research. We gather direct data about the type, relevance, and availability of information to decision makers at the time of the acquisition. Using these data, we show that greater information availability serves to decrease overpayment and enhance post-acquisition performance.

Previous studies have shown that prior ties between acquirer and target result in more successful acquisitions (Zaheer et al. 2010). Our analysis shows that this relation is mediated by the extent of relevant, target-specific information available to the acquirer at the time of acquisition. Thus, our analysis enables the clarification of the causal path between

prior ties and acquisition success, which has been assumed in prior studies.[1] Prior ties enable firms to reduce information constraints and thereby decrease the adverse effects of an information gap on target valuation and future firm performance. In addition, while rival bidders have been considered a "threat" to acquisition processes as they provide upward pressures on target pricing, we identify an alternative signaling-based role for rival bids. In particular, we provide evidence consistent with the argument that private information of other firms conveyed by rival bids serves as a positive signal under uncertainty. Particularly when in the bidding process information about the target is limited, rival bidders serve to mitigate the adverse effects of lacking information on overpayment and acquisition performance. We show that the signaling effect of rival bidders' privately held information about the target's value is strongest when there is a gap in non-financial information needed to value the target, which is less publicly available and less likely to be evenly distributed among potential acquirers. This indicates that an open bidding process for acquisition targets reflects private information from different parties. Finally, we also answer calls to tackle acquisition research in new ways (Meglio and Risberg 2010), particularly by collecting fine-grained survey data directly at the highest level of decision making. This complements prior studies on acquisitions that have used publicly available archival data, which by necessity use less precise proxies to measure decision dynamics.

The remainder of this paper proceeds as follows. Section II reviews previous literature on corporate acquisitions, information asymmetries in acquisitions, prior relations between targets and acquirers, and the influence of rival bidders to develop testable hypotheses. Section III describes the research method, including data and variables, and Section IV discusses results. The paper concludes in Section V with a discussion of the conclusions and limitations.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A substantial body of literature has examined whether corporate acquisitions generally succeed in fulfilling intended goals, and under which circumstances (Haleblian, Devers, McNamara, Carpenter, and Davison 2009). Both the financial and managerial literature are generally pessimistic about corporate acquisitions: a majority of acquisitions are said to destroy shareholder value for acquiring firms and to fail to reach set goals (Schoenberg 2006). Several rationales exist for engaging in acquisitions despite these findings. Many managers motivate acquisitions with expected synergies, which are argued to increase the value of the acquisition beyond its intrinsic value. If synergies are realized, acquisitions will be profitable as long as these synergies are larger than the premium that has been paid (Andrade et al. 2001; Capron 1999; Capron and Shen 2007; Schoenberg 2006). However, this motivation cannot explain why many acquisitions end up as value destroying for the acquirer's shareholders. Acquisition research has therefore focused on two other explanations.

Under the managerialism hypothesis (Mueller 1969), managers willingly overpay for target firms to maximize their own utility (e.g., their own remuneration, power, future prospects, or ego). Bargeron, Schlingemann, Stulz, and Zutter (2008) show that acquirers with higher managerial and institutional ownership pay lower premiums when making an acquisition, as their management has a greater incentive to maximize returns from acquisitions and avoid value-destroying deals. Corporate governance structures therefore play an important role in decision making (Netter, Poulsen, and Stegemoller 2009). The hubris hypothesis (Roll 1986), on the other hand, is closely related to the problem of information asymmetry. It states that managers generally overestimate their own ability to value targets and to extract potential synergies. Given that target shareholders only accept a specific minimum price and have more information on the firm's intrinsic value, it will generally be the acquirer who overvalues the target and synergies the most, who makes the highest bid, resulting in a low or negative return. As the highest bidder usually gets to acquire the target, the acquirer is generally the bidder who overvalued most. This effect is commonly known as "the winner's curse."

Recent studies emphasize that corporate acquisitions are a multifaceted phenomenon where a range of objectives and motivations can be at play (Cartwright and Schoenberg 2006; Meglio and Risberg 2010). Studies also argue that comparing corporate stock returns and accounting measures likely provides an incomplete view on acquisition success, which is in itself a complex concept (Cording, Christmann, and Weigelt 2010; Meglio and Risberg 2011). Accordingly, measuring decision-making factors and evaluations of success at the managerial level provides more direct, lower-level observations that can provide complementary insights on questions that are hard to answer using only financial measurements. Particularly, direct performance assessments provided by informed managers enable the inclusion of information that may not be well incorporated in accounting or stock market measures.

[1] Gow, Larcker, and Reiss (2016) emphasize the importance of testing assumed causal chains in accounting studies based on observational data. Our collection of survey data enables more direct examination of theorized causal relations between constructs that are not easily measured using archival data (in particular information availability).

Information Asymmetries in Corporate Acquisitions

Both the overvaluation by acquirers and the selection of unsuitable acquisition targets are often attributed to information asymmetries between buyers and sellers (Hansen 1987). The management of a target firm is more likely to know the intrinsic value of their firm and is unlikely to accept offers below this intrinsic value. The management of a bidding firm might either under- or overvalue the target firm, but since only high bids are likely to be accepted, this generally leads to overpayment by the buyer.[2] Both hubris and managerialism become more problematic under uncertain conditions, as honest overvaluations become more likely and it becomes easier to justify or obfuscate intentional overpayment (Duchin and Schmidt 2013). Indeed, Moeller, Schlingemann, and Stulz (2007) find that uncertainty about valuation is a strong driver of return dispersion in acquisitions. In addition to overpayment (partially) offsetting synergy gains, the uncertainty associated with acquisitions affects acquirers' access to capital, further impacting future performance (Erickson, Wang, and Zhang 2012). Even so, returns for acquirers purchasing private targets are generally higher than for those acquiring public targets, despite information being more readily available for the latter (Cooney, Moeller, and Stegemoller 2009). This effect is ascribed to acquirers of private firms having valuable private information. In situations where they do not possess such information, research finds that public target acquisitions are more successful (Capron and Shen 2007). Positive information that is not publicly available provides more value-creating opportunities, as it is generally not fully reflected in valuations.

Several prior studies have shown that sources of private information that decrease uncertainty contribute to more successful acquisitions. For example, Carow, Heron, and Saxton (2004) find that acquirers realize larger returns when they behave consistently with having private information: make bids in related industries, during industry expansion phases and financed by cash. Martin and Shalev (2017) find that acquisitions of targets for which more firm-specific information is available create more value. McNichols and Stubben (2015) and Raman et al. (2013) more specifically find that acquirers overpay less for target firms with higher accounting quality. For shareholders of targets with higher accounting quality, returns are lower, while returns to acquirers are higher, indicating that there is less information asymmetry. Marquardt and Zur (2014) and Skaife and Wangerin (2013) also find that for target firms with higher accounting quality, less negotiation is involved in the process and deals are more likely to be completed.

The involvement of knowledgeable third parties also appears to reduce the information asymmetry problem. Louis (2005) suggests that non-Big 4 accounting firms have closer relations to their local businesses and therefore have more private information. He shows that acquirers using non-Big 4 accounting firms in the acquisition process earn higher returns on acquisitions, especially when they have a greater advisory role. This effect is stronger when targets are privately owned and private information is more valuable. Sanders and Boivie (2004) show that when firms are hard to value, markets turn to indirect sources of information, such as institutional and blockholder stock ownership and venture capital participation. More generally, information is recognized in literature as a valuable asset, even if determining that value is difficult (Moody and Walsh 1999).

Apart from decision making and valuation prior to the acquisition, information about the target available to the acquirer may be used to facilitate post-acquisition integration. Acquiring a target firm often means moving from a market-based relation, a hybrid relation, or no relation between both firms to a more hierarchical model, which requires more information to coordinate (Caglio and Ditillo 2008; Håkansson and Lind 2004). An acquisition in this sense could be compared to an inter-organizational relationship in which there is relatively limited appropriation risk (as all post-acquisition gains accrue to the merged firm), but a high degree of coordination risk that requires control (Dekker 2004). A higher level of interdependence between organizations creates a higher need for information processing to coordinate and integrate (Dekker, Ding, and Groot 2016), which is particularly the case in an acquisition.[3]

Based on previous literature, we expect that low information availability on the part of the acquirer (i.e., an information gap) is likely to result in overvaluation and less successful acquisitions. An information gap results in greater information asymmetry, a stronger negotiation position for the target firm and worse decision making by the acquirer. Lacking relevant information can impact future performance in two ways. First, through greater overpayment, acquirers require more costly financing while returns on the investment are lower (Erickson et al. 2012; Martynova and Renneboog 2009). Second, less well-informed acquisitions are likely to result in integration problems, as the interdependencies associated with an acquisition

[2] Under uncertain conditions, acquirers often elect to use their own stock for payment as a form of risk sharing. Should the acquisition prove less successful than expected, this will impact the acquirer's stock price, thus placing some of the negative consequences with the target shareholders. Officer et al. (2009) find that in situations of high target valuation uncertainty, stock payments result in higher returns to the acquirer. Stock payments have become such a popular way to hedge uncertainty that their use has become a way to measure uncertainty (Reuer and Ragozzino 2008).

[3] Note that integration success and subsequent performance are affected by more factors than information availability, such as an acquirer's information processing capacity and ability to achieve expected synergies. While important, these determinants are beyond the scope of this paper.

necessitate complex coordination (Dekker 2004). Strategic mismatches become more likely, and acquisition goals become more difficult to achieve (Datta 1991). Accordingly, we hypothesize that:

H1a: An acquirer's information gap is positively associated with acquisition target overpayment.

H1b: An acquirer's information gap is negatively associated with post-acquisition performance.

Prior Relations between Target and Acquirer

One potential way in which information asymmetry between target and acquirer can be reduced is through engaging in pre-acquisition alliances or relationships that increase the acquirer's information about the target. The information that acquirers obtain from prior ties may help inform the acquisition decision and such ties may even be set up intentionally to "test drive" a prospective merger. Arend (2004) shows theoretically that alliances are useful as an acquisition decision tool when the outputs and results of the cooperation are a good reflection of both firm value and future joint results.

Existing relationships between firms can constitute a critical source of information, as working with another firm can reveal much about it that would be more difficult to discover using publicly available information, management information systems, and due diligence. Gulati and Gargiulo (1999) argue that prior relations can become repositories of firm-specific information. Dekker and Van den Abbeele (2010) show that experience in working with a supplier leads to higher information availability about the supplier. Repeated transactions also require less costly interfirm control mechanisms. Reuer and Ragozzino (2008) find that pre-acquisition alliances between acquirer and target reduce the amount of stock used as payment in the acquisition, indicating that alliances serve as an alternative way to reduce uncertainty. Zaheer et al. (2010) find that prior alliances are helpful in cross-border acquisitions, where information asymmetry is greater. In addition, they find that alliances involving greater interaction between the partner firms have a greater positive impact than alliances with less intensive interaction.

In the case of corporate acquisitions, prior relations can provide an indication of future performance for the merged firm (Arend 2004; Porrini 2004; Reuer and Ragozzino 2008). Harford, Schonlau, and Stanfield (2018) find that trade partners are not only more likely to merge than other firms, but also that returns for these mergers are higher. These relations constitute a form of direct *ex ante* information gathering about the target, similar to a due diligence process. Information obtained in this way is similar to inside information available to target management and should allow for better valuation (Lee 1992). This type of knowledge about a target should be more valuable for targets for which information is otherwise unavailable or hard to obtain. Prior relations can also directly affect decision making and performance, for example by reducing agency costs through trust development and by providing enhanced communication channels during integration (Dekker 2004). On the other hand, relationship and trust development might also result in a reduced focus on information acquisition that would be needed for target valuation. In addition, prior relations may also generate concerns that extend beyond a potential acquisition as information about a target may have value to a potential acquirer even if no acquisition is made (e.g., in negotiations about trade conditions). This could make the management of the target firm more careful in sharing critical information. These competing arguments provide tension in the potential effects of prior relationships on the acquirer's information gap. However, our expectation is that the information-gathering potential of prior relations should, on average, outweigh such concerns about secrecy.

We examine the effect of prior relations on information availability. This effect is assumed in prior studies, but to our knowledge has not been empirically tested. Based on the outlined arguments, we hypothesize that:

H2: A prior relation between acquirer and target reduces the acquirer's information gap.

Rival Bidders

While prior literature on information asymmetry in mergers and acquisitions (M&A) has focused primarily on the relationship between acquirer and target, and the availability of information to both, the broader marketplace and influences of other parties are beginning to receive more attention. Reuer, Tong, and Wu (2012) show that well-connected targets, with associations to well-known investment banks, private equity, and alliance partners, are often priced more accurately. The presence of rival bidders has often been viewed to increase prices through bidding wars and therefore to result in overpayment (Hietala, Kaplan, and Robinson 2003). However, more recent research provides evidence of the informational value of other acquirers in the market. Cai, Song, and Walkling (2011) show that unanticipated acquisitions in an industry signal opportunities for subsequent acquisitions in the industry. Haunschild (1994) shows that acquirers decide on what level of premium to pay based on acquisitions by related companies and the advice of professional firms.

Still, while target shareholders might welcome bidding wars, acquirers usually do not favor the chance of being outbid and the potential price increases that rival bidders can cause. Flanagan and O'Shaughnessy (2003) show that premiums on public targets are indeed higher when multiple bidders are present, but only when the acquirer's and target's businesses are not related.

Bradley, Desai, and Kim (1988) show theoretically that a higher number of bidders results in a higher percentage of gains accruing to target shareholders, even if it does not impact total gains. There is also evidence of increasing numbers of lock-up agreements used during acquisitions with the purpose to exclude potential rival bidders (Burch 2001). However, Slusky and Caves (1991), and Aktas, De Bodt, and Roll (2010) show that it is not necessary for rival bidders to make an actual offer, and that the potential of rivals making an offer is a sufficient condition for the winner's curse to manifest. The threat of rival bids, through competition in the broader market, in itself drives bids up to a point where all publicly available information is reflected in the bid. If, however, a bid still invites rival bids beyond that point, such additional bids should reflect additional information that is not generally accessible. Boone and Mulherin (2008) find that lower returns do not stem from the winner's curse in contested acquisitions, but from more competitive market situations prior to bidding. They also find no difference in post-acquisition performance of negotiated acquisitions and auctioned acquisitions. Limiting open market competition may therefore come at the expense of excluding valuable information held by other parties from being considered in valuation, which can result in a less efficient market for corporate control. Burch (2001) finds that situations that exclude rival bidders, such as lock-up agreements, result in lower acquirer returns. Target management, being better aware of the intrinsic value of their firm, is compensated for missing out on other potential bids, while acquirers cannot benefit from other bidders' private information. While multiple bids can thus drive the price up beyond the market equilibrium, as long as the bids are based on private information they should not drive the price up beyond fair or fundamental value. Actual offers for the target can therefore be interpreted as a positive signal, indicating that the target is somehow undervalued. The fact that rival companies place bids may thus signal their private information about the value of the target.

While prior archival studies on the performance effects of rival bidders have assumed the presence of uncertainty, we more directly examine how the presence of rival bidders moderates the effects of information availability on acquisition pricing and post-acquisition performance. We argue that the informational value of rival bidders increases when information availability to a potential acquirer is low. Other bidders signal that a target firm is an interesting acquisition prospect. As far as target value is readily apparent to the market it will be reflected in the acquisition price. Where information about this value is scarce, information or signals are more valuable to potential acquirers. In these circumstances, private information in the hands of rivals, such as information resulting from their prior relations or informed connections, can be signaled through a bid. While it might not be possible to know what private information might be available to other bidders, tendering an acquisition bid is a significant commitment and therefore a strong signal about rivals' valuation of the target firm. Acting on these signals is expected to decrease the impact of information asymmetry between acquirer and target, and consequently to result in better outcomes for the acquirer.

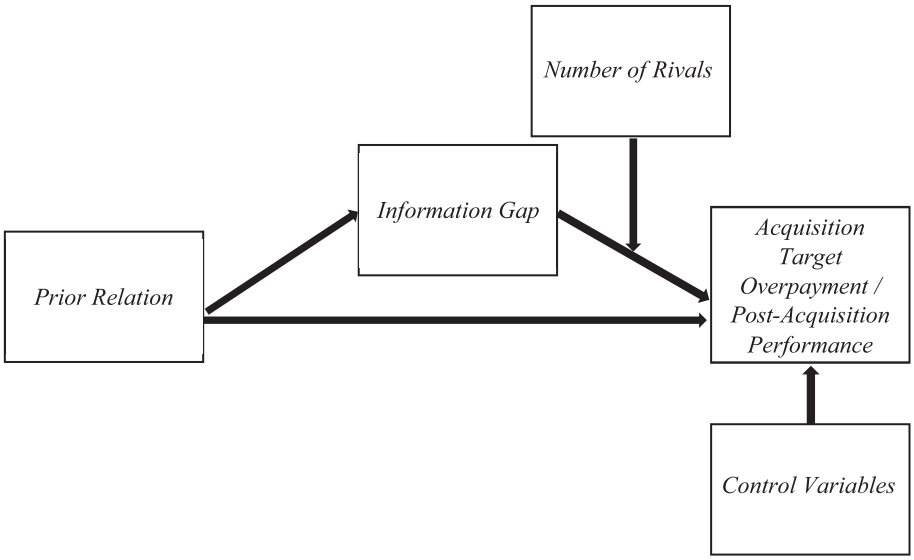
Rival firms tendering a bid in the acquisition process signal their own valuation of the target, meaning they believe the target to be worth at least the value of their bid. Informed rival bidders with private information thereby give a signal about the intrinsic value of the target. When this intrinsic value is less clear to other potential acquirers, this signal is more valuable. This is the case for situations in which information relevant to valuation is missing and uncertainty is high. While high uncertainty may impede firms from placing a bid for a potentially interesting target in the first place, the signals about target value derived from bids by other firms may even induce a firm facing a high information gap to engage in the bidding process itself. When adequate information is already available about the target, valuation by the acquirer should be more accurate regardless. In that case, the signals of rival bidders' bids should have less impact. Thus, while the presence of rival bidders does not in itself lead to more information being available to the eventual acquirer, the signals derived from rival bids are expected to moderate the effects of a gap in available information. We therefore expect that the presence of more rival bidders weakens the influence of an information gap on target overpayment, thus decreasing overpayment under low information availability. Similarly, the predicted negative influence of an information gap on post-acquisition performance can be expected to weaken in the presence of more rival bidders, thus resulting in increased performance under low information availability. We hypothesize that:

H3a: The number of rival bidders weakens the positive association between the acquirer's information gap and target overpayment.

H3b: The number of rival bidders weakens the negative association between the acquirer's information gap and post-acquisition performance.

Information about target firms is a heterogeneous concept, as different types of information useful for target valuation exist. An important distinction is between financial and non-financial information. A lack of financial information would make it particularly hard to value a target and estimate financial synergies, increasing overpayment and decreasing performance. Furthermore, financial information available to one bidder is often also available to others. This can be due to the level of public disclosure, but also because all bidding parties in an acquisition auction must be allowed the same access to this type of information (Marquardt and Zur 2014). Accordingly, if there were a gap in the availability of this information to the eventual acquirer, it would be unlikely to be available to others, and consequently rival bids are less likely to signal this type of information. In contrast, non-financial information about various aspects of the target firm can be held to different degrees by

FIGURE 1
Graphical Representation of the Structural Equation Model



This figure shows the graphical representation of the main structural equation model in this study. The effects of *Prior Relation* on *Acquisition Target Overpayment* and *Post-Acquisition Performance* are mediated by the *Information Gap*. The effect of the *Information Gap* is moderated by the *Number of Rivals*.

different parties, as it is generally more difficult to obtain and more diverse. Examples are production and supply information, which might be partially available to buyers and suppliers, human resources (HR) systems information available to those who have contacts with (former) employees, market information available to competitors in the same sector, and so forth. Different firms can have different levels and types of access to non-financial information about the target. A lack of this type of information not only makes it difficult to assess the intangible assets and value of a firm, but also to integrate successfully after the acquisition. Since this type of information can be exclusively available to other parties, we expect the signaling value of rival bidders to be stronger when there is a gap in non-financial information.

H4a: The number of rival bidders weakens the positive association between the acquirer's information gap and target overpayment more for non-financial information than for financial information.

H4b: The number of rival bidders weakens the negative association between the acquirer's information gap and post-acquisition performance more for non-financial information than for financial information.

Figure 1 summarizes the main constructs and their hypothesized effect.

III. RESEARCH METHOD

Data Sample

To test the hypotheses, we collected survey data in 2009 and 2010 from Belgian and Dutch acquirers. The population for this study is drawn from the Zephyr database by Bureau Van Dijk. This database contains a comprehensive set of publicly available information on M&A. From this database we selected all acquisitions from 2005 to 2007 for which the acquiring company's headquarters was located in either Belgium or The Netherlands.[4] We deliberately sampled not-too-recent acquisitions to be able to assess the outcomes of the acquisition. This resulted in a list of 2,681 acquisitions by 1,871 unique acquirers (see Table 1 for population characteristics). For acquirers that made more than one acquisition during our time window only one acquisition (the most recent) was used to avoid over-representing firm-specific effects.

[4] We selected Belgium and The Netherlands as this was expected to generate familiarity of potential respondents with the universities with which the researchers are affiliated, and thus the ability to address them in their own language. There are no strongly differing or unique institutional features in these countries that would make the M&A environment different from other countries, which would limit generalizability of the findings.

TABLE 1

Descriptive Statistics

	Min	Max	Mean	Standard Deviation
Acquisition Target Overpayment	1.000	5.000	3.140	1.109
Post-Acquisition Performance	−1.865	1.479	0.000	0.866
Information Gap	0.000	38.000	10.584	9.873
Financial Information Gap	0.000	13.000	3.080	3.244
Non-Financial Information Gap	0.000	24.999	7.506	7.286
Prior Relation	0.000	1.000	0.260	0.441
Number of Rival Bidders	0.000	5.000	0.560	1.262
Due Diligence	−2.939	2.034	0.000	0.947
Hostile	0.000	1.000	0.130	0.338
Subsidiary	0.000	1.000	0.623	0.488
Relative Size	0.000	6.550	2.682	1.481
Same Industry	0.000	1.000	0.494	0.503
Pre-Acquisition Performance Acquirer	−2.666	1.695	0.000	0.811
Pre-Acquisition Performance Target	−1.600	1.441	0.000	0.829

See Appendix A for explanation of variable measurement.

An intensive contact procedure was used over a period of 10 weeks. A structured telephone interview was used to solicit participation and to identify a key decision maker in the acquisition process. During this process, 620 firms were excluded as unsuitable[5] and 792 refused to participate.[6] Of the 459 firms that agreed to participate, a key informant responsible for the acquisition was identified (typically CEOs, CFOs, and acquisition managers). Having been closely involved with the acquisition was a strict precondition that we imposed for informants to participate in order to ensure high reliability of responses. After the conversation, the informant was personally sent a link to the online survey to be filled out for the acquisition identified. To increase the response rate, non-respondents were sent a reminder and received two additional telephone calls. In total a sample of 93 responses was obtained, representing a field response rate of 20.26 percent (93 out of 459 firms), and an overall effective response rate of 7.43 percent (93 out of 1,251 firms). We excluded observations with missing data and partial acquisitions not so labeled in the Zephyr database,[7] leaving a sample of 77 transactions for analysis. Respondents reported an average tenure of 12.9 years at the acquiring firm. Respondents were asked to indicate the acquisition price, for which the average was €66.59 million. Some 16 acquirers in our sample were publicly quoted on the stock exchange; the other 61 acquirers were private companies. Two target firms were listed at the time of the acquisition, while all other targets in our sample were private firms. Overall, our sample consists largely of smaller, private acquisitions, mostly by private acquirers. This type of sample lends itself well to our research questions, as information for these types of targets is typically less readily available and more dispersed. Managers at private acquiring firms are also less prone to agency issues, which should make their bid signals more informative of the target's true value.

As described in the next sections, we build on prior studies to develop measurement instruments for the constructs of interest. In developing the questionnaire, we consulted four experienced acquisition consultants from three major consulting firms. These experts provided an assessment of the relevance and validity of our measurement items, and the wording of questions. In addition, based on their company practices and consulting experience in the valuation of acquisition targets, they also provided suggestions for additional items to be added when they deemed construct measures did not capture all relevant aspects. As explained later, this, for instance, was the case for information relevance and availability where the experts

[5] Reasons for exclusion were that firms could not be reached (354; e.g., out of business, location change), the acquirer was not a firm but a private person (118), the acquirer belonged to the same group as other firms and had the same key informant (73), the headquarters or decision makers were located in a foreign country (52), or the firm indicated that they were not involved in an acquisition (23).

[6] A question from the telephone interview indicated reasons for not participating: no time (299), key informant not present (147), company policy is not to participate in surveys (144), not interested (139), and various other reasons (63; e.g., some firms were currently intensively involved with other acquisitions or were themselves acquired).

[7] Thirteen survey responses were only partly filled out, with many missing variables. One other case lacked information on relative size, while two other cases were excluded as they concerned partial acquisitions.

suggested adding several information elements not included in the measurement instrument adopted from prior literature. Appendix A provides a summary of the variable measures developed in the next sections.

Dependent Variables

As a measure of under- or overpayment for the target organization at the time of the acquisition, respondents were asked whether they believed their firm had paid the correct price, or had under- or overpaid. Respondents answered on a five-point Likert scale ranging from "Far too little" (1) to "Far too much" (5) (*Acquisition Target Overpayment*). This measure is subjective in nature. We choose this method because given our research design using well-informed respondents this information is readily available. Contrary to accounting-based measures, subjective assessment can provide a more complete picture of organizational value (Schoenberg 2006; Papadakis and Thanos 2010), also capturing intangible value as well as forward-looking information. While stock price changes provide an integrated metric of market expectations, this information is only available for listed companies and only reflects investors' perceptions at a certain point in time (e.g., after an announcement). Unlike stock prices, subjective assessment by informed evaluators enables us to separate the success and pricing of the acquisition from other determinants of performance, and can provide a longer time frame in assessing post-acquisition performance (Meglio and Risberg 2011; Papadakis and Thanos 2010). Using a survey-based measure at the managerial level thus allows us to capture decision making and performance more directly. We guaranteed anonymity and confidential treatment of the data, which reduces managers' incentive to over-represent the consequences of their own decision making. Furthermore, we included all questions on overpayment and performance in the last section of the survey in order to prevent responses to these questions from influencing questions about information availability and pre-acquisition conditions. The average response on the item is 3.1, close to the middle of the scale; variation is significant (std. dev. = 1.11), and all response categories on the scale (1–5) were used. This increases confidence that respondents answered truthfully.

Papadakis and Thanos (2010) find that subjective performance assessments by managers correlate positively with financial accounting measures such as a change in return on assets (ROA). Therefore, as a validation check, we collected the ROA of the acquiring firm in the years surrounding the acquisition from Bureau van Dijk. We subtracted the acquiring firm's average ROA in the two years prior to the acquisition from the average ROA of the merged firms two years following the acquisition to calculate *ROA Change*. We disregard the year of the acquisition, as restructuring and financing of the acquisition might temporarily distort financial performance. In Belgium and The Netherlands, small private firms are required to provide annual accounting data to the Chamber of Commerce, and this information is publicly available. For the historical data necessary for our analyses we use the Amadeus database (Bureau van Dijk). The necessary data were available for 49 cases. As expected, the Spearman correlation between *ROA Change* and *Acquisition Target Overpayment* is negative (−0.32) and significant ($p < 0.05$).[8] This supports measurement validity.

As a second measure to assess the quality of the takeover decision, we asked respondents to assess the post-acquisition performance of the merged company, both financially and non-financially (Cronbach Alpha 0.74). Responses were coded on a five-point Likert scale (1: Greatly deteriorated; 5: Greatly improved) and the (untabulated) Spearman correlation between the two items is 0.61 ($p < 0.01$). The average responses are 3.6 and 3.7 respectively, again providing confidence that there is no substantial overstatement of the self-reported performance. Principal axis factoring extracted a single factor that we label *Post-Acquisition Performance*. We use factor scores for the subsequent analyses. The Spearman correlation between *Post-Acquisition Performance* and *ROA Change* is 0.26 ($p < 0.05$), indicating that greater self-reported performance is associated with objectively measured performance. In addition, *Post-Acquisition Performance* correlates negatively and significantly with *Acquisition Target Overpayment* ($r = -0.55$; $p < 0.01$), supporting the expectation that overpayment is negatively associated with subsequent performance of the merged firm.

Independent Variables

Uncertainty surrounding an acquisition is usually measured using publicly available data such as stock price volatility and analyst forecast dispersion (Moeller et al. 2007). Given the possibility to collect managerial-level data, we are able to measure the relevance and availability of information more directly. We define the concept of *Information Gap* as the extent to which information deemed relevant by acquirers for valuing a target firm was missing. That is, it constitutes a composite measure showing the difference between the information that was required and that was available. As each acquisition is different, other types of information may be more or less important for each. Using this measure that combines information relevance and

[8] Given the unambiguous expectations and reduced number of observations, the validity tests using *ROA Change* are based on one-tailed significance. Note that *Acquisition Target Overpayment* contains only an assessment of the price paid for the target firm, and *Post-Acquisition Performance* reflects a broader assessment (including non-financial performance) and is benchmarked to competing firms. Accordingly, very large correlations with *ROA Change* (which is narrower, specific to a year, and not relative to competitors) were not to be expected.

availability, we account for these differences. Relevant information is measured using 23 items (see Appendix B). These are based on a scale of perceived usefulness of management accounting information developed by Chenhall and Morris (1986) encompassing scope, aggregation, timeliness, and integration of information. This scale has been used extensively in prior research (e.g., Gul and Chia 1994; Mangaliso 1995; Bouwens and Abernethy 2000). Based on feedback by the four acquisition experts, we added ten items that captured relevant financial (e.g., sales, cash flow) and non-financial (e.g., operations, staff, and R&D) information elements, which in their experience were considered relevant for target valuation. Particularly, to identify these additional items, the experts relied on their consulting firm's internal company documentation and processes and procedures for target valuation. The calculation of the *Information Gap* variable is based on a measure for information relevance as described by Pizzini (2006): respondents were first asked to rate on a five-point Likert scale the extent to which the 23 different kinds of information were required to value the target company. They were also asked to rate for the same 23 kinds of information the extent to which the target company could actually provide this information (again on a five-point Likert scale).[9] Positive differences indicate a lack of information, while negative differences indicate superfluous information, which is irrelevant for measuring the information gap. Therefore, the non-negative differences between the requirement scores and availability scores are summed and divided by 23 to create the variable *Information Gap*.[10]

As a validity test, we also asked respondents to rate, on a five-point Likert scale, how difficult it was to assess several aspects of the target firm's value (see Appendix A) at the moment of the acquisition. Principal axis factoring extracts one factor with an eigenvalue greater than 1 (Cronbach Alpha 0.76), which we label *Valuation Difficulty*. The Spearman correlation between *Information Gap* and *Valuation Difficulty* is 0.43 ($p < 0.01$), providing evidence of construct validity of the first measure.

To test H4a and H4b, we divide the *Information Gap* measure into two distinct dimensions: *Financial Information Gap* and *Non-Financial Information Gap*. For this purpose, we assign the 23 information items to each construct based on their content, as indicated in Appendix B.

Prior Relation is a measure of whether any pre-existing relation between acquirer and target had existed. Respondents were asked "*Was there a prior relationship (e.g., strategic alliance, buyer-supplier relationship) between the acquirer and the acquired firm?*" Negative answers to the first question are coded as 0, positive answers as 1.

The *Number of Rivals* was measured by asking respondents to indicate the number of rival bidders involved in the bidding process. We assume in this measure that acquirers are aware rival bidders were present.[11] The average number of rival bidders is 0.56 with a standard deviation of 1.26, which indicates much variation between acquisitions in the number of rival bidders. In 22.1 percent of the cases rival bidders were present in the bidding process, with more than one rival bidder in 14.3 percent of the cases.

Control Variables

In our model estimations we control for a number of variables that prior research has found to influence acquisition pricing and performance. A key practice to determine acquisition decisions and pricing is the due diligence process, where more extensive due diligence may result in better decision making. In the questionnaire, respondents rated the extent to which 11 areas (e.g., financial, legal, strategy, IT, HR) were covered by a due diligence process (Cronbach Alpha 0.88). We subject the set of items to principal axis factoring to extract one factor, which we label *Due Diligence*.[12]

Respondents were also asked whether the acquisition was negotiated or hostile. The answer was coded in a dummy variable *Hostile* with a value of 0 for a negotiated acquisition and 1 for a hostile takeover. Several studies show that hostile takeovers are more successful for a variety of reasons (Cartwright and Schoenberg 2006; Sudarsanam and Mahate 2006; Tuch and O'Sullivan 2007). We additionally asked the respondents whether the target would be integrated into the acquiring firm or kept as an independent subsidiary. We coded *Subsidiary* as a dummy equaling 1 for independent subsidiaries, and 0 otherwise. Relative size of target firms can also influence acquisition success (Tuch and O'Sullivan 2007). To control for the size difference between acquirer and target, respondents were asked to compare firm sizes based on the number of employees of each. The answer was given as a percentage, with percentages below 100 percent indicating that the target was smaller than the

[9] The 23 specific types of information that we asked about normally are primarily obtained from the target's internal information systems, but there might also be other sources that the measure does not capture (e.g., public disclosures by the target or acquisition consultant estimates).

[10] There is significant within-firm variation across the 23 items in indicated need for and availability of information, and in the resulting information gap. This indicates that respondents differentiated between the information types and did not aim to answer consistently.

[11] We consider this to be a credible assumption since in case of multiple bidders the target often makes bidders aware of rivals to increase the acquisition conditions, frequently leading to a bidding race.

[12] For parsimony of reporting we force the factor analysis to extract one factor of the intensity of due diligence. The analysis, however, identified three factors with an eigenvalue greater than 1, which correspond to different focus areas during the due diligence process (i.e., liabilities, organizational, and financial/legal). Estimating the models with the three factors instead does not appreciably influence the results and inferences regarding our hypotheses.

acquirer and percentages above 100 percent indicating that the target was larger than the acquirer. Given the skewed distribution, we use the natural logarithm of the answers as our measure of *Relative Size*.

Prior research indicates that related acquisitions, or the acquisitions of more similar firms, are more successful than unrelated ones (King, Dalton, Daily, and Covin 2004). We therefore use Nomenclature des Activités Économiques dans la Communauté Européenne (NACE) industry codes obtained from the Zephyr database to code the *Same Industry* dummy variable with value 1 if acquirer and target share a two-digit NACE code, and 0 otherwise. We also control for performance of both acquirer and target before the acquisition, as these have been identified as important determinants of post-acquisition performance (Haleblian et al. 2009). We measure pre-acquisition performance of both firms using four items (two per firm) that compare both financial and non-financial performance (one item each) with each firm's main competitors on five-point Likert scales, ranging from "Well below average" to "Well above average." Principal axis factoring extracted two factors with an eigenvalue greater than 1 and significant factor loadings, which we label *Pre-Acquisition Performance Target* (Cronbach Alpha 0.68) and *Pre-Acquisition Performance Acquirer* (Cronbach Alpha 0.65).

Estimation Method

In order to test the hypotheses, we make use of structural equation modeling using partial least squares (PLS) estimation, which is recommended for smaller sample sizes (Henseler et al. 2014). Figure 1 graphically depicts the structural model tested. Prior relations are modeled as a direct source of target-specific information that can aid in valuing the target and increasing future performance. On the other hand, the presence of rival bidders is a signal of the target's value that does not directly reduce an information gap, but is especially informative in situations where there is a lack of direct, target-specific information. We expect a positive path coefficient between *Information Gap* and *Acquisition Target Overpayment*, showing that lower information availability leads to worse valuations and more overpayment (H1a). The path coefficient between *Information Gap* and *Post-Acquisition Performance* is expected to be negative, based on the expectation that less information availability leads to worse acquisitions and subsequent performance (H1b). If prior relations increase the availability of information to acquirers, we expect a negative path coefficient between *Prior Relation* and *Information Gap* (H2). Prior relations should thus indirectly (i.e., through *Information Gap*) reduce *Acquisition Target Overpayment* and enhance *Post-Acquisition Performance*. We also estimate the direct path between *Prior Relation* and *Acquisition Target Overpayment,* as relational factors in an acquisition that is not at arm's length (e.g., trust development) could potentially impact pricing. Similarly, the direct path between *Prior Relation* and *Post-Acquisition Performance* is estimated, as some communicative and cooperative routines might already exist, facilitating integration and enhancing performance.

We introduce an unstandardized product indicator interaction term between *Number of Rivals* and *Information Gap* to test the expectation that rival bids provide a signal of the target's value that reduces the impact of *Information Gap* on *Acquisition Target Overpayment* and on *Post-Acquisition Performance*. We thus expect the coefficient of this interaction term on *Acquisition Target Overpayment* to be negative (H3a), and on *Post-Acquisition Performance* to be positive (H3b). We then re-estimate these models, substituting *Information Gap* for either *Financial Information Gap* or *Non-Financial Information Gap*. We expect the signaling effect of *Number of Rivals* to be stronger when *Non-Financial Information Gap* is high. In contrast, for *Financial Information Gap,* we expect its signaling value to be weaker (H4a and H4b). The same control variables are used for all models. Path coefficients are estimated using the consistent PLS methodology (Chin 1998; Dijkstra and Henseler 2015); t-statistics and p-values are obtained by bootstrapping, using 1,000 subsamples.

IV. RESULTS

Descriptive Statistics

Table 1 reports descriptive statistics for all variables. For 92.2 percent of the sampled acquisitions, respondents reported an *Information Gap* between required and available information for valuation. The mean score of *Information Gap* for an acquisition was 10.584 (out of a theoretical maximum of 92), with a standard deviation of 9.873. In 22.1 percent of cases, rival bidders were involved in the bidding process.[13] A prior relation existed between acquirer and target in 26.0 percent of cases, and 13.0 percent of acquisitions were *Hostile*. Both *Same Industry* (49.4 percent) and different industry acquisitions are represented in the sample, as are *Subsidiary* acquisitions (62.3 percent), and acquisitions where the target will be integrated into the acquiring firm.

[13] Dependent on the source of information, previous studies show wide variation in the proportion of acquisitions where rival bidders were present, from around 10 percent (Betton and Eckbo 2000; Cooney et al. 2009) to around 50 percent (Aktas et al. 2010; Boone and Mulherin 2007; Marquardt and Zur 2014).

Table 2 shows the Spearman correlations between all variables used in our analyses. *Information Gap* correlates positively with *Acquisition Target Overpayment* (0.38; $p < 0.01$) and negatively with *Post-Acquisition Performance* (–0.46; $p < 0.01$). The correlation between *Prior Relation* and *Information Gap* is negative (–0.19; $p > 0.10$), but not significant. *Number of Rivals* correlates negatively with *Acquisition Target Overpayment* (–0.29; $p < 0.05$), and positively with *Post-Acquisition Performance* (0.23; $p < 0.05$). The correlations between the independent and control variables do not cause concern about multicollinearity.

To alleviate concerns about discriminant validity, we conducted a heterotrait-monotrait (HTMT) test as proposed by Henseler, Ringle, and Sarstedt (2015), and find no HTMT criterion greater than 0.60 for any of the multi-item measures (*Information Gap, Post-Acquisition Performance, Due Diligence, Pre-Acquisition Performance Acquirer,* and *Pre-Acquisition Performance Target*). As suggested by Fornell and Larcker (1981), we also verified that the squared correlations between variables were smaller than the average variances extracted for those variables.[14]

Main Results

Table 3 reports the PLS results. Four models are estimated, with Models 1 and 2 including *Acquisition Target Overpayment* as the outcome variable, and Models 3 and 4 including *Post-Acquisition Performance* as the outcome variable. Models 1 and 3 include only main effects, while Models 2 and 4 add the interaction term between *Information Gap* and *Number of Rivals*.

As the coefficient estimates in Models 1 and 3 show, the main effect of *Information Gap* on *Acquisition Target Overpayment* is positive and significant, while its effect on *Post-Acquisition Performance* is negative and significant. These results provide support for H1a and H1b. The coefficient for *Prior Relation* (–0.207; $p < 0.05$) is negative and significant in all four models, indicating that having a prior relation with the target reduces the acquirer's information gap. This provides support for H2. Consistent with the expectation that *Prior Relation* indirectly (i.e., through reducing the *Information Gap*) reduces *Acquisition Target Overpayment* and enhances *Post-Acquisition Performance,* the indirect effect estimates in Models 1 and 3 have the expected sign and are significant (–0.057, $p < 0.10$ and 0.074, $p < 0.05$, respectively). The main effect of *Number of Rivals* on *Acquisition Target Overpayment* (–0.486; $p < 0.01$) is also significantly negative, while its effect on *Post-Acquisition Performance* is positive but not significant (0.168). Thus, respondents indicated less overpayment when the bidding process involved other bidders besides the eventual acquirer.

In Models 2 and 4 an interaction term between *Number of Rivals* and *Information Gap* is added to test whether the presence of rival bidders moderates the impact of *Information Gap* on *Acquisition Target Overpayment* and on *Post-Acquisition Performance*. The regression coefficient is significantly negative (–0.032; $p < 0.05$) in Model 2 and significantly positive in Model 4 (0.030; $p < 0.10$). These results indicate that *Number of Rivals* weakens the positive effect of *Information Gap* on *Acquisition Target Overpayment* and the negative effect on *Post-Acquisition Performance,* and thus provides support for H3a and H3b. Note that the main effect for *Number of Rivals* on *Acquisition Target Overpayment* remains significant (–0.612; $p < 0.01$) in Model 2, while in Model 4 its positive effect on *Post-Acquisition Performance* becomes insignificant (–0.113; $p > 0.10$). This could indicate that regardless of the information available, undervalued acquisition targets attract more bidders.

Regarding the control variables, the results for Models 1 and 2 show that a more elaborate due diligence process and higher pre-acquisition performance of the target reduce overpayment. Models 3 and 4 show that post-acquisition performance is primarily enhanced by pre-acquisition performance of the acquirer and marginally significantly by pre-acquisition performance of the target. Hostile takeovers have a marginally significant negative impact on post-acquisition performance.

Table 4 reports the results for the differentiated information gap measures. Both types of information gap have a positive effect on *Acquisition Target Overpayment* (Models 5 and 7), and a negative effect on *Post-Acquisition Performance* (Models 9 and 11). Having a prior relation with the target decreases the gap for both types of information. However, the interaction of *Number of Rivals* with *Financial Information Gap* is not significant on either *Acquisition Target Overpayment* in Model 6 or *Post-Acquisition Performance* in Model 10, while the interaction with *Non-Financial Information Gap* in both Models 8 and 12 is significant and in the expected direction. An additional test of coefficient differences shows that the interaction effect on *Acquisition Target Overpayment* is significantly stronger in Model 8 as compared to Model 6 ($z = 1.403$; $p = 0.08$ one-tailed).

[14] We also ran an exploratory factor analysis on all Likert-scale perception-based items, excluding the 23 information gap items. The factor solution (total variance explained 73.66 percent) behaves in line with our theorized constructs, distinguishing between the dimensions of *Due Diligence, Pre-Acquisition Performance Acquirer, Pre-Acquisition Performance Target,* but also providing as one factor the overpayment item (loading negatively) with the post-acquisition performance items (loading positively). Overpayment and *Post-Acquisition Performance* are indeed closely related but we keep these separated in our analysis as they are conceptually distinct. Overall, this additional test also supports discriminant validity with and among the other dimensions.

TABLE 2

Correlations between Model Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) *Acquisition Target Overpayment*	1												
(2) *Post-Acquisition Performance*	−0.551	1											
(3) *Information Gap*	0.377	−0.460	1										
(4) *Financial Information Gap*	0.505	−0.531	0.787	1									
(5) *Non-Financial Information Gap*	0.318	−0.407	0.964	0.627	1								
(6) *Prior Relation*	−0.188	0.247	−0.186	−0.238	−0.127	1							
(7) *Number of Rival Bidders*	−0.292	0.231	−0.108	0.245	−0.056	0.215	1						
(8) *Due Diligence*	−0.144	0.145	−0.022	−0.117	0.021	0.027	0.056	1					
(9) *Hostile*	−0.057	−0.176	0.106	0.051	0.127	−0.141	0.516	−0.076	1				
(10) *Subsidiary*	0.159	−0.119	0.245	0.310	0.185	−0.212	−0.294	−0.026	−0.019	1			
(11) *Relative Size*	−0.286	0.316	−0.267	−0.326	−0.239	0.092	0.516	0.098	0.106	−0.187	1		
(12) *Same Industry*	−0.046	−0.099	0.066	0.110	0.055	0.067	−0.209	0.049	−0.072	0.124	−0.180	1	
(13) *Pre-Acquisition Performance Acquirer*	−0.172	0.072	−0.006	0.051	−0.039	0.151	−0.068	−0.103	0.030	0.169	−0.145	0.109	1
(14) *Pre-Acquisition Performance Target*	−0.269	0.215	−0.301	−0.181	0.003	−0.009	−0.254	0.002	−0.263	0.094	0.029	0.052	0.074

Correlations greater than |0.189|, |0.224|, and |0.293| are significant at 0.10, 0.05, and 0.01, respectively (two-tailed).
n = 77.
See Appendix A for explanation of variable measurement.

TABLE 3
PLS Results

Panel A: Dependent Variable: *Information Gap*

	Prediction	Model 1	Model 2	Model 3	Model 4
Prior Relation	H2: −	−0.207***	−0.207**	−0.207**	−0.207**
		(−2.360)	(−2.291)	(−2.294)	(−2.333)

Panel B: Dependent Variable: *Acquisition Target Overpayment*

	Prediction	Model 1	Model 2
Information Gap	H1a: +	0.276**	0.155
		(2.305)	(1.135)
Prior Relation		−0.048	−0.039
		(−0.542)	(−0.450)
Number of Rivals		−0.486***	−0.612***
		(−2.813)	(−3.492)
Number of Rivals ∗ Information Gap	H3a: −		−0.032**
			(−1.876)
Due Diligence		−0.162**	−0.163**
		(−2.031)	(−1.978)
Hostile		0.106	0.034
		(0.786)	(0.285)
Subsidiary		0.043	0.085
		(0.445)	(0.949)
Relative Size		0.036	0.074
		(0.283)	(0.586)
Same Industry		−0.103	−0.129
		(−1.022)	(−1.271)
Pre-Acquisition Performance Acquirer		−0.174*	−0.153*
		(−1.836)	(−1.705)
Pre-Acquisition Performance Target		−0.271***	−0.334***
		(−2.730)	(−3.712)
Indirect Effect of *Prior Relation*		−0.057*	−0.068**
		(1.543)	(1.790)
Adjusted R^2		0.336	0.373

(continued on next page)

The interaction effect on *Post-Acquisition Performance* is also stronger in Model 12 as compared to Model 10, but the difference is not significant ($z = 0.715$; $p = 0.23$ one-tailed). Jointly, the results are in line with the expectation of H4a and H4b that the signaling value of rival bidders is particularly valuable when there is a lack of non-financial information, but not when there is a lack of financial information. The effects of control variables for Models 5 through 12 remain largely the same as for Models 1 through 4.

Robustness Tests

To test the robustness of our results, we repeat the PLS estimation using different operationalizations of model variables and alternative model structures. Appendix C summarizes the results of these robustness tests, which we label with Panels A to M.

In robustness tests reported in Panel A to Panel C, we use alternative measures of *Information Gap*. In the Panel A test we use the natural logarithm of the original measure. In the Panel B test we scale the original measure, which is the sum of the differences between relevance and availability of the 23 information items, by the total sum of the relevance scores of all 23 items. We also substitute *Information Gap* with the measure of *Valuation Difficulty* that we used for validity testing to test if our results are sensitive to the use of the information measure (Panel C test). For this last test, the path coefficients of *Prior Relation* on *Valuation Difficulty* are just insignificant ($p = 0.12$). This might be in part due to *Valuation Difficulty* being a less direct measure of target-specific information. Besides this, all results, inferences, and conclusions for these alternative measures are similar.

TABLE 3 (continued)

Panel C: Dependent Variable: *Post-Acquisition Performance*

	Prediction	Model 3	Model 4
Information Gap		−0.356***	−0.406***
	H1b: −	(−3.048)	(−3.657)
Prior Relation		0.003	−0.010
		(0.024)	(−0.099)
Number of Rivals		0.168	−0.113
		(1.026)	(−0.620)
Number of Rivals ∗ Information Gap			0.030*
	H3b: +		(1.548)
Due Diligence		0.092	0.093
		(0.807)	(0.852)
Hostile		−0.282**	−0.214
		(−1.972)	(−1.608)
Subsidiary		−0.046	−0.086
		(−0.363)	(−0.677)
Relative Size		0.177*	0.141
		(1.819)	(1.148)
Same Industry		−0.117	−0.092
		(−1.153)	(−0.945)
Pre-Acquisition Performance Acquirer		0.265***	0.245**
		(2.500)	(2.426)
Pre-Acquisition Performance Target		0.115	0.175*
		(1.152)	(1.805)
Indirect Effect of *Prior Relation*		0.074**	0.076**
		(2.107)	(2.347)
Adjusted R^2		0.291	0.321

***, **, * Significant at the 1 percent, 5 percent, and 10 percent levels, respectively (one-tailed for hypothesized effects; two-tailed for all other effects). This table shows the path coefficients of four partial least squares structural equation models and associated t-values (in parentheses). In Models 1 and 2 the ultimate dependent variable is *Acquisition Target Overpayment*. In Models 3 and 4 the ultimate dependent variable is *Post-Acquisition Performance*. n = 77.
See Appendix A for explanation of variable measurement.

In Panels D and E tests, we repeat our analysis replacing *Prior Relation* with a variable that captures the number of years the prior relation had been ongoing, with 0 years indicating there was no prior relation between acquirer and target. Values ranged between 0 and 25 years, with a mean of 1.450 and a standard deviation of 3.608. We repeat the analyses using the natural logarithm of this variable (Panel D test), and also weighted the prior relation using a questionnaire item about the intensity of the prior relation (Panel E test).[15] Again, all inferences and conclusions remain the same.

In the main analysis, *Number of Rivals* is operationalized as a raw count of other bidders involved in the bidding stage. The number of bidding parties is important, as more bidders signal that the target has intrinsic value and this value is not only extractable by uniquely positioned acquirers.[16] More interest also increases the probability that genuine value is signaled and the rival bid is not simply coincidence or due to managerial reasons. Using in test Panel F, as alternative measurement, the natural logarithm of 1 plus *Number of Rivals* yields similar results and inferences. We also replace the *Number of Rivals* with a dummy variable with a value of 0 if no rival bidders were present and 1 if there were (Panel G test). Using this dummy variable results in the interaction terms with *Information Gap* to become insignificant. This indicates that the signaling value of rival bidders is not just based on their presence, but instead increases with their number.

In test Panel H, we re-estimate the models controlling for the natural logarithm of the number of acquisitions the respondent had been involved with before. Prior research has shown that acquisition experience may impact the outcome of

[15] Respondents rated the intensity of the relation before the acquisition on a 1–5 scale, while no prior relation was coded as 0.
[16] Of all cases with rival bidders, only in six was one rival bidder present, while the rest had multiple rival bidders.

TABLE 4

PLS Results for Information Types

Panel A: Dependent Variable: *Financial Information Gap* (*Non-Financial Information Gap*)

	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Dependent Variables:							
	Financial Information Gap		*Non-Financial Information Gap*		*Financial Information Gap*		*Non-Financial Information Gap*	
Prior Relation	−0.226***	−0.226***	−0.181**	−0.181**	−0.226***	−0.226***	−0.181**	−0.181**
	(−2.712)	(−2.786)	(−1.969)	(−1.961)	(−2.683)	(−2.730)	(−1.962)	(−1.951)

Panel B: Dependent Variable: *Acquisition Target Overpayment*

	Prediction	Model 5	Model 6	Model 7	Model 8
Financial Information Gap		0.424***	0.422***		
		(4.725)	(4.663)		
Non-Financial Information Gap				0.183*	0.266**
				(1.324)	(1.814)
Prior Relation		−0.028	−0.028	−0.059	−0.045
		(−0.322)	(−0.332)	(−0.646)	(−0.526)
Number of Rivals		−0.421***	−0.435**	−0.525***	−0.200
		(−2.863)	(−2.284)	(−3.359)	(−1.023)
Number of Rivals ∗ *Financial Information Gap*	H4a: ?/−		0.050		
			(0.133)		
Number of Rivals ∗ *Non-Financial Information Gap*	H4a: − −				−0.732**
					(−1.767)
Due Diligence		−0.118	−0.118	−0.168**	−0.176**
		(−1.429)	(−1.377)	(−2.060)	(−2.226)
Hostile		0.066	0.063	0.138	0.029
		(0.552)	(0.477)	(1.048)	(0.212)
Subsidiary		0.021	0.019	0.064	0.109
		(0.223)	(0.206)	(0.623)	(1.169)
Relative Size		0.071	0.072	0.024	0.075
		(0.539)	(0.523)	(0.165)	(0.550)
Same Industry		−0.113	−0.113	−0.098	−0.131
		(−1.268)	(−1.182)	(−0.934)	(−1.224)
Pre-Acquisition Performance Acquirer		−0.171*	−0.171*	−0.179*	−0.150
		(−1.823)	(−1.788)	(−1.837)	(−1.510)
Pre-Acquisition Performance Target		−0.269***	−0.270***	−0.292***	−0.372***
		(−2.834)	(−2.767)	(−2.637)	(−4.497)
Indirect Effect of *Prior Relation*		−0.096**	−0.095**	−0.033	−0.040*
		(2.309)	(−2.339)	(1.036)	(−1.361)
Adjusted R^2		0.425	0.416	0.299	0.350

(continued on next page)

acquisitions (Haleblian and Finkelstein 1999; Hayward 2002). Respondents had on average been involved with 8.810 acquisitions, with a standard deviation of 9.578. Including the experience measure does not impact the significance levels of the variables of interest.

Prior research has also shown that under uncertainty, acquirers sometimes effectively use stock payment as a method of risk sharing (Officer et al. 2009). In our dataset, only in four cases was stock used in combination with cash, and in two other cases stock was used exclusively for acquisition payment. Re-estimating in test Panel I the models including a dummy variable to indicate if stock was used (1) or not (0) provides similar results.

TABLE 4 (continued)

Panel C: Dependent Variable: *Post-Acquisition Performance*

	Prediction	Model 9	Model 10	Model 11	Model 12
Financial Information Gap		−0.370***	−0.382***		
		(−3.422)	(−3.424)		
Non-Financial Information Gap				−0.310***	−0.384**
				(−2.638)	(−3.434)
Prior Relation		−0.009	−0.006	0.006	−0.006
		(−0.083)	(−0.053)	(0.059)	(−0.062)
Number of Rivals		0.150	0.073	0.198	−0.093
		(1.022)	(0.450)	(1.235)	(−0.546)
Number of Rivals ∗ Financial Information Gap			0.271		
	H4b: ?/+		(0.719)		
Number of Rivals ∗ Non-Financial Information Gap					0.656**
	H4b: + +				(1.701)
Due Diligence		0.051	0.048	0.106	0.112
		(0.444)	(0.391)	(0.939)	(0.994)
Hostile		−0.281**	−0.298**	−0.302**	−0.205*
		(−2.144)	(−1.989)	(−2.044)	(−1.672)
Subsidiary		−0.050	−0.057	−0.059	−0.099
		(−0.414)	(−0.444)	(−0.456)	(−0.787)
Relative Size		0.153	0.158	0.189*	0.144
		(1.398)	(1.388)	(1.840)	(1.272)
Same Industry		−0.113	−0.112	−0.121	−0.091
		(−1.137)	(−1.099)	(−1.161)	(−0.787)
Pre-Acquisition Performance Acquirer		0.269**	0.269**	0.267**	0.241**
		(2.530)	(2.413)	(2.508)	(2.352)
Pre-Acquisition Performance Target		0.142	0.133	0.123	0.194**
		(1.462)	(1.363)	(1.254)	(1.984)
Indirect Effect of *Prior Relation*		0.083***	0.080***	0.056*	0.063*
		(2.441)	(2.472)	(1.716)	(1.922)
Adjusted R^2		0.298	0.295	0.266	0.304

***, **, * Significant at the 1 percent, 5 percent, and 10 percent levels, respectively (one-tailed for hypothesized effects; two-tailed for all other effects). This table shows the path coefficients and associated t values (in parentheses) of the same models as Table 3, but replacing *Information Gap* with *Financial Information Gap* in Models 5, 6, 9, and 10, and with *Non-Financial Information Gap* in Models 7, 8, 11, and 12. n = 77.
See Appendix A for explanation of variable measurement.

Two target firms in our sample were publicly listed on the stock market at the time of the acquisition. Since this could influence the information available about them, as well as pricing and performance directly, we exclude these two cases from our sample and repeat the analyses in test Panel J. All inferences and conclusions remain the same.

It can be argued that several of our control variables may also impact *Information Gap*. We therefore re-estimate in test Panel K the structural model adding paths from the deal characteristics (i.e., all control variables excluding *Pre-Acquisition Performance Acquirer*) to *Information Gap,* and find similar results.

The deals in our sample were completed between 2005 and 2007, while the collection of survey data took place in 2009 and 2010. We deliberately allowed for some time between acquisition and response because some information may take time to come to light, and post-acquisition processes needed to take place. However, considerable variability exists in the time between the acquisition and the survey. A longer period may influence respondents' perceptions, while also more information may have come to light and more processes may have been completed. As differences in measurement lag might affect the results, we re-estimate in test Panel L the models including a control variable for the time in months between deal completion and survey, and find similar results.

It is conceivable that trust existing between parties prior to deal closing biases the acquirer's evaluation of outcomes. High trust might make an acquirer conclude more readily that a fair price was paid and that outcomes were positive. To assess the effects of this potential confounding factor, in test Panel M we add a survey item to the model that captures the extent to which "during the negotiation a relationship developed based on mutual benefit and trust." While this item does not necessarily reflect

ex ante trust, we use it as it is applicable to acquisitions regardless of whether or not a prior relation existed. Results and inferences remain the same. Overall this series of robustness tests indicates that our findings are robust to changes in operationalization and control variables used.

Finally, some authors have argued against the use of PLS path modeling for hypothesis testing (Rönkkö, McIntosh, Antonakis, and Edwards 2016). To alleviate concerns that our results are a consequence of the estimation method used, we re-estimate Models 1 to 4 as mediation and moderated mediation models following the methodology described by Preacher and Hayes (2008) (Panel N test). The formal bootstrap tests proposed by Preacher and Hayes (2008) confirm that both indirect effects of *Prior Relation* in Models 1 and 3 are significant at the 0.05 level. They also confirm that the moderation effects in Models 2 and 4 are significant at the 0.05 level. All our conclusions therefore remain the same.

V. DISCUSSION

A central concern in prior research on corporate acquisitions is the risk of overpayment for acquisition targets, which causes acquiring firms not to realize anticipated benefits. While prior research has considered valuation uncertainty as a primary reason for overpayment, not much research has examined the role of information availability about the target in the valuation process. Our findings show that information constraints about acquisition targets are associated with both greater overpayment and weaker *ex post* performance of the merged firm. Our findings also describe how acquirers can mitigate risks of information constraints and consequent overpayment. On the one hand, through engaging in pre-acquisition relations with the target, firms are able to obtain private information about the target, which improves target valuation and acquisition decisions. On the other hand, private information held by other parties can be signaled through their bidding behavior. Such signals increase in value with the information gap that an acquirer faces. Information about acquisition targets is dispersed between potential acquirers, which is especially true for private, unlisted targets, where no central market exists to combine and price information.

Earlier literature proposes that pre-acquisition alliances and relationships result in more successful mergers (Arend 2004; Zaheer et al. 2010). We provide a closer assessment of one causal path that underlies this relationship, which we show is mediated by the availability of information to acquirers at the time of the acquisition. Information is a valuable asset in corporate acquisition decisions. We find that when information relevant for target valuation is missing, there is more overpayment and a reduced *ex post* performance of the merged firm. In line with the interpretation of pre-merger alliances forming an alternative to due diligence, we find that a prior relation with the target firm increases information availability for the acquirer, which in turn reduces overpayment and increases performance of the merged firm. Prior relations are a helpful tool to gather information about prospective merger partners. Our results suggest that prior relations can provide concrete information about the target that is, in turn, beneficial for target valuation and post-acquisition performance, as information constraints fully mediate the relationship between prior relations and target valuation and post-acquisition performance.

Furthermore, our results show that the effects of information constraints on valuation and performance are moderated by the presence of rival bidders: the more rival bidders that are involved in the acquisition process, the less positive the impact of an information gap on both overpayment and post-acquisition performance is. We propose that this effect is due to rivals providing a credible signal about the target's inherent value when a lack of target-specific information makes it difficult for the acquirer to value it directly. This proposition is strengthened by the finding that this effect is largely due to a signal of non-financial information. This information is less uniformly available across potential acquirers, and could therefore be held to different degrees and thus be signaled more strongly by the presence of other bidders. These findings provide valuable insights for acquiring managers and acquiring firms' shareholders. Our results suggest that the presence of rival bidders does not necessarily result in a higher price or an irrational bidding war. Conversely, we find that in situations of low information availability, the interest of rival bidders can provide a valuable signal about the target firm's value, and result in less overpayment and higher post-acquisition performance. Interest by third parties can provide a valuable signal and potential acquirers are wise to consider what other players in the market are doing, even if no centralized market for the target's stock exists. Despite attempts by regulators to ensure potential acquirers equal access to information, private information plays an important role.

Our findings need to be interpreted in light of several limitations of the study. One limitation relates to the sample size. While the type of data collected allows detailed insight into the conditions, information environment, and consequences of acquisitions, the nature of the data and level at which they were collected preclude large-scale studies of this type, as opposed to studies using publicly available data. However, traditional measures of uncertainty, such as stock price volatility and analyst consensus are necessarily indirect measures of the information available to acquiring firms and limit the scope of these studies to publicly traded target firms. Although more difficult to obtain, direct measurement of information considered relevant and available at the managerial level enables us to provide deeper insight into the valuation decision process. Our study thus complements those that use publicly available information, such as stock prices and analyst reports, by providing a more complete and fine-grained analysis of the information environment that acquirers face. Furthermore, our data comprise mainly

private firms. Only two target firms were listed at the time of the acquisition. Information is generally more available about publicly listed firms than about private firms. We therefore are cautious to generalize our findings to public firms. It would be interesting in the future to study to what extent our findings hold for publicly listed firms.

Another limitation is the fact that information on each case was collected using a single survey after completion of the acquisition. The reliability of measurement may be enhanced when collecting multiple observations from involved managers per acquisition. However, care was taken to identify the key decision maker in each acquisition as the key informant for this survey in order to enhance measurement reliability. Similarly, the single moment of measurement might create concerns about the possibility of hindsight bias. Given the eventual success of the acquisition, respondents might over- or underestimate the availability of information and difficulty in valuing the target. While hindsight bias might affect the direct effects of an information gap, the identified moderation effects are unlikely to be driven by such a bias. In addition, several key variables are of factual nature (prior ties, rival bidders), which are unlikely to suffer from hindsight bias, and we conducted validity tests for other key variables. Indeed, both overpayment and post-acquisition performance correlate significantly with an objective and independently collected measure of ROA change, while the measure of the information gap is validated by an alternatively measured construct of valuation difficulty.

Given the importance of rival bidders in this study, more information about the nature of these rival bids and bidders could help in further exploring the identified effect and revealing critical dynamics during the bidding stage. Our analysis can be seen to provide evidence on the average value of the information signal of rival bids, but our data do not allow us to differentiate between situations in which this value is higher or lower. In particular, knowledge about the nature of the relationship between rival bidders and the target, as well as among rival bidders, could provide valuable insights. These relations partly determine the amount of private information rival bidders have, and thereby the value of the signal that their bid provides. Collecting data of this nature, especially on the bidding behavior and private information of involved competing firms, is difficult. Most bids are confidential and typically only accepted bids become public. This means that content information about alternative bids is also not available for empirical studies like ours, but often would also not be available to managers during the bidding process. This may differ for larger listed firms where bids and bidders are disclosed more often. Furthermore, the competitive position of these firms may prohibit obtaining matched survey responses.

Notwithstanding these limitations, our findings demonstrate the importance of resolving information constraints in avoiding acquisition target overpayment, and how prior ties and rival bids directly or indirectly help overcome the risks of such constraints by enhancing the acquirer's information environment.

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APPENDIX A

Summary of Variable Measures

Measure	Description
Acquisition Target Overpayment	Assessment of price paid for the acquisition target (1: Far too little; 5: Far too much).
Post-Acquisition Performance	Mean score of the evolution of financial and non-financial performance of the merged firm after the acquisition compared to its main competitors (1: Greatly deteriorated; 5: Greatly improved).
Information Gap	The positive differences between the extent to which 23 different kinds of information were required to value the target company and the extent to which the target company's information systems actually provided this information (both on Likert scales with 1: Not at all; 5: To a very great extent). Appendix B provides the measurement items, and describes which items relate to the sub-dimensions *Financial Information Gap* and *Non-Financial Information Gap*.
Prior Relation	Indicator variable equal to 1 when a prior relation existed between target and acquirer, and 0 otherwise.
Number of Rival Bidders	Number of rival bidders involved in the acquisition process.
Control Variables	
Due Diligence	Factor score of 11 items about the extent to which the following areas were covered by a due diligence process (1: Not at all; 5: To a very great extent): Financial, Legal, Tax, Commercial, HR, Pension fund, IT, Environmental, Strategic, Operational, Organizational.
Relative Size	Natural logarithm of the percentage of the number of employees the target employs relative to the acquirer's employee base.
Hostile	Indicator variable equal to 1 for hostile takeovers and 0 for negotiated acquisitions.
Same Industry	Indicator variable equal to 1 if the acquiring and target firms had the same two-digit NACE code.
Subsidiary	Indicator variable equal to 1 if the target firm was to be kept as an independent subsidiary after acquisition, and 0 otherwise.
Pre-Acquisition Performance Target	Mean score of financial and non-financial pre-acquisition performance of the target firm compared to its main competitors (1: Well below average; 5: Well above average).
Pre-Acquisition Performance Acquirer	Mean score of financial and non-financial pre-acquisition performance of the acquiring firm compared to its main competitors (1: Well below average; 5: Well above average).
Variables in Validation Tests	
ROA Change	The average ROA of the merged firms two years following the acquisition minus the average ROA of the acquiring firm in the two years prior to the acquisition, as obtained from Bureau van Dijk.
Valuation Difficulty	Factor score of five items about difficulty at moment of acquisition to (1: Very easy; 5: Very difficult): (1) predict the market conditions, (2) compare the products/services offered by the target firm with those of similar firms, (3) compare the value of the target firm with the value of similar firms, (4) estimate a fair acquisition price for the target firm, and (5) predict potential integration difficulties and costs for the acquisition.

APPENDIX B

Information Gap Questions

The following items, scored both on the extent to which the information was required for valuation and the extent to which it was available, make up the *Information Gap* scale. Items included in the *Financial Information Gap* subscales are indicated by (*F*), and those included in the *Non-Financial Information Gap* subscale by (*NF*). Respondents were asked the following question (1: Not at all; 5: To a very great extent):

> Please indicate to what extent the following types of information were required to value the target at the moment of the acquisition (irrespective of whether this information was actually available). Please also indicate to what extent the acquired firm's information systems actually provided the following information at the moment of the acquisition.

Based on Expert Interviews

- Information about sales, marketing and clients such as margin analyses, long-term sales and distribution agreements, terms of trade, intra-group sales, competitors and customers analyses. (*F*)
- Information about production, purchase and supply such as production plans, warehouse information, capacity (un)used, total cost of goods purchased, long-term purchase agreements and supplier analyses. (*NF*)
- Forecasts of cash flows, sales and profit, key forecasting assumptions and comparisons between forecasts and actual results. (*F*)
- Detailed cost information about raw materials, payroll costs, R&D, administration, selling and other overhead costs. (*F*)
- Inventory information per category (raw materials, work in process, finished goods, trade goods) & explanation of production variances (split into labor, materials and overhead). (*NF*)
- Information about long-term assets such as capital budgeting techniques used and post-implementation audits to evaluate past long-term investment decisions. (*F*)
- Performance measurement information about key performance indicators, performance evaluations and incentive systems. (*NF*)
- Legal information about contracts and agreements, intellectual property, real estate and insurance policies. (*NF*)
- Environmental information about waste disposal, emissions and required clean-up works. (*NF*)
- Social information such as staff lists mentioning age, responsibilities, seniority, position, remuneration and benefits, overtime, stock option plans, group insurance and/or pension scheme. (*NF*)

Based on Chenhall and Morris (1986)

- Market information such as market size and growth rate. (*NF*)
- Production information such as output rates, scrap levels, machine efficiency and employee absenteeism. (*NF*)
- Information about R&D and innovation capabilities such as new products and patents. (*NF*)
- Information about relations and perceptions, such as customer preferences, employee attitudes, labor relations, attitudes of government and competitive threats. (*NF*)
- Information about broad factors external to the organization on economic conditions, population growth and technological developments. (*NF*)
- Information about the different sections or functional areas in the organization, such as marketing and production, or sales, cost, and profit centers. (*NF*)
- Costs separated into fixed and variable components. (*F*)
- Information about the effect of events on particular time periods (e.g., monthly/quarterly/annual summaries, trends, comparisons, etc.). (*NF*)
- Frequent reports that are provided on a systematic, regular basis: e.g., daily or weekly reports. (*NF*)
- Timely information so that there is no delay between an event occurring and relevant information being reported. (*NF*)
- Automatically distributed information supplied to decision makers as soon as processing is completed. (*NF*)
- Information on the impact that decisions in one department have on other departments. (*NF*)
- Precise targets for the activities within different departments visualizing the cause-and-effect linkages between the different activities. (*NF*)

APPENDIX C
Robustness Tests

Panel A: *Log Information Gap*

	Model 1	Model 2	Model 3	Model 4
DV: Log Information Gap				
Prior Relation	−0.166**	−0.166*	−0.166*	−0.166*
	(−1.653)	(−1.619)	(−1.586)	(−1.595)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Log Information Gap	0.155*	0.219	−0.394***	−0.443***
	(1.291)	(0.641)	(−3.573)	(−2.792)
Prior Relation	−0.061	−0.045	−0.002	−0.014
	(−0.643)	(−0.517)	(−0.019)	(−3.792)
Number of Rivals	−0.544***	−0.038***	0.201*	0.241*
	(−3.479)	(0.126)	(1.367)	(0.867)
Number of Rivals ∗ Log Information Gap		−0.250**		0.191*
		(−2.301)		(1.513)
Adjusted R^2	0.290	0.329	0.317	0.336

Panel B: Scaled *Information Gap*

	Model 1	Model 2	Model 3	Model 4
DV: Scaled Information Gap				
Prior Relation	−0.217***	−0.217**	−0.217**	−0.217***
	(−2.376)	(−2.428)	(−2.314)	(−2.306)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Scaled Information Gap	0.234**	0.287**	−0.352***	−0.396***
	(1.914)	(2.138)	(−3.319)	(−3.626)
Prior Relation	−0.038	−0.027	−0.022	−0.032
	(−0.429)	(−0.293)	(−0.213)	(−0.302)
Number of Rivals	−0.518***	−0.171	0.197	−0.090
	(−3.297)	(−0.851)	(1.250)	(0.462)
Number of Rivals ∗ Scaled Information Gap		−2.290**		1.894*
		(−1.723)		(1.497)
Adjusted R^2	0.320	0.358	0.294	0.317

Panel C: *Valuation Difficulty*

	Model 1	Model 2	Model 3	Model 4
DV: Valuation Difficulty				
Prior Relation	−0.147	−0.147	−0.147	−0.147
	(−1.116)	(−1.222)	(−1.114)	(−1.101)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Valuation Difficulty	0.183*	0.302***	−0.178*	−0.275**
	(1.626)	(2.901)	(−1.458)	(−2.235)
Prior Relation	−0.061	−0.000	0.018	−0.031
	(−0.604)	(−0.001)	(0.160)	(−0.268)
Number of Rivals	−0.573***	−0.594***	0.282**	0.299*
	(−3.348)	(−3.551)	(1.853)	(1.683)
Number of Rivals ∗ Valuation Difficulty		−0.210*		0.171*
		(−1.623)		(1.346)
Adjusted R^2	0.304	0.345	0.212	0.234

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APPENDIX C (continued)

Panel D: *Length Prior Relation*

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Length Prior Relation	−0.203***	−0.203***	−0.203***	−0.203**
	(−2.416)	(−2.441)	(−2.365)	(−2.448)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.269**	0.322	−0.350***	−0.399***
	(2.185)	(2.453)	(−2.904)	(−3.544)
Length Prior Relation	−0.087	−0.093	0.037	0.042
	(−0.984)	(−1.082)	(0.307)	(0.386)
Number of Rivals	−0.491***	−0.188	0.168	−0.114*
	(−3.124)	(−0.992)	(1.041)	(−0.267)
Number of Rivals ∗ Information Gap		−0.033**		0.030*
		(−2.041)		(1.386)
Adjusted R^2	0.341	0.379	0.292	0.323

Panel E: *Intensity Prior Relation*

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Intensity Prior Relation	−0.159**	−0.159**	−0.159**	−0.159**
	(−1.685)	(−1.648)	(−1.707)	(−1.727)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.276**	0.330	−0.354***	−0.405*
	(2.246)	(2.780)	(−3.127)	(−3.576)
Intensity Prior Relation	−0.065	−0.045	0.022	0.003
	(−0.688)	(−0.469)	(0.205)	(0.034)
Number of Rivals	−0.483***	−0.190***	0.166	−0.113
	(−2.971)	(−1.069)	(1.080)	(−0.629)
Number of Rivals ∗ Information Gap		−0.032**		0.030*
		(−1.923)		(1.535)
Adjusted R^2	0.338	0.373	0.291	0.322

Panel F: *Log Number of Rivals*

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−0.207**	−0.207**	−0.207**	−0.207**
	(−2.256)	(−2.302)	(−2.185)	(−2.272)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.293***	0.344***	−0.350***	−0.408***
	(2.410)	(2.641)	(−2.928)	(−3.556)
Prior Relation	−0.026	−0.020	−0.018	−0.024
	(−0.300)	(−0.217)	(−0.166)	(−0.223)
Log Number of Rivals	−0.445***	−0.212	0.231	0.033
	(−3.254)	(−1.172)	(1.267)	(0.184)
Log Number of Rivals ∗ Information Gap		−0.054*		0.061*
		(−1.334)		(1.513)
Adjusted R^2	0.318	0.336	0.302	0.328

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APPENDIX C (continued)

Panel G: *Dummy Rivals*

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−0.207**	−0.207**	−0.207**	−0.207**
	(−2.284)	(−2.280)	(−2.288)	(−2.246)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.335***	0.373***	−0.361***	−0.406***
	(2.796)	(2.888)	(−3.320)	(−3.648)
Prior Relation	−0.012	−0.007	−0.049	−0.055
	(−0.128)	(−0.073)	(−0.444)	(−0.489)
Dummy Rivals	−0.284***	−0.146	0.265**	0.101
	(−2.427)	(−0.938)	(1.678)	(0.592)
Dummy Rivals ∗ Information Gap		−0.039		0.047
		(−0.789)		(1.002)
Adjusted R^2	0.270	0.272	0.319	0.324

Panel H: *Acquisition Experience*

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−0.207**	−0.207**	−0.207**	−0.207**
	(−2.270)	(−2.348)	(−2.331)	(−2.314)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.278**	0.340***	−0.356***	−0.414***
	(2.252)	(2.751)	(−2.915)	(−3.656)
Prior Relation	−0.051	−0.046	−0.001	−0.006
	(−0.578)	(−0.500)	(−0.005)	(−0.051)
Number of Rivals	−0.490***	−0.160	0.171	−0.134*
	(−3.049)	(−0.827)	(1.035)	(−0.737)
Number of Rivals ∗ Information Gap		−0.036**		0.033**
		(−2.083)		(1.699)
Adjusted R^2	0.328	0.473	0.281	0.426

Panel I: Payment Method

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−0.207**	−0.207**	−0.207***	−0.207**
	(−2.243)	(−2.225)	(−2.397)	(−2.318)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.276**	0.330	−0.356***	−0.406***
	(2.256)	(2.454)	(−2.885)	(−3.399)
Prior Relation	−0.050	−0.042	−0.001	−0.014
	(−0.551)	(−0.477)	(−0.005)	(−0.130)
Number of Rivals	−0.484***	−0.181	0.171	−0.103
	(−2.814)	(−0.909)	(1.068)	(−0.526)
Number of Rivals ∗ Information Gap		−0.032**		0.030*
		(−1.830)		(1.341)
Adjusted R^2	0.327	0.366	0.281	0.320

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APPENDIX C (continued)

Panel J: Unlisted Targets

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−0.209**	−0.209**	−0.209**	−0.209**
	(−2.213)	(−2.206)	(−2.234)	(−2.389)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.314***	0.376***	−0.356***	−0.410***
	(2.795)	(3.144)	(−2.949)	(−3.495)
Prior Relation	−0.076	−0.065	0.013	0.004
	(−0.916)	(−0.760)	(0.124)	(0.037)
Number of Rivals	−0.500***	−0.169	0.178	−0.110*
	(−3.139)	(−0.909)	(1.067)	(−0.599)
Number of Rivals ∗ Information Gap		−0.035***		0.030**
		(−2.414)		(1.741)
Adjusted R^2	0.385	0.433	0.283	0.316

Panel K: Controls *Information Gap*

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−0.135*	−0.135*	−0.135*	−0.135*
	(−1.330)	(−1.421)	(−1.385)	(−1.441)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.276**	0.330***	−0.356***	−0.406*
	(2.273)	(2.623)	(−3.038)	(−3.697)
Prior Relation	−0.048	−0.039	−0.003	−0.010
	(−0.556)	(−0.458)	(−0.023)	(−0.103)
Number of Rivals	−0.486***	−0.188	0.168	−0.113
	(−2.899)	(−1.035)	(1.047)	(−0.589)
Number of Rivals ∗ Information Gap		−0.032**		0.030*
		(−1.902)		(1.631)
Adjusted R^2	0.336	0.373	0.291	0.321

Panel L: Time to Survey Control

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−4.640**	−4.640**	−4.640**	−4.640**
	(−1.836)	(−1.836)	(−1.836)	(−1.836)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.031***	0.037***	−0.032***	−0.036***
	(2.595)	(3.104)	(−3.038)	(−1.674)
Prior Relation	−0.120	−0.099	−0.005	−0.021
	(−0.465)	(−0.394)	(−0.023)	(−0.101)
Number of Rivals	−0.427***	−0.165	0.115	−0.077
	(−3.307)	(−0.957)	(1.108)	(−0.551)
Number of Rivals ∗ Information Gap		−0.035**		0.026**
		(−2.205)		(2.001)
Adjusted R^2	0.336	0.373	0.291	0.321

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APPENDIX C (continued)

Panel M: Trust

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−0.207***	−0.207***	−0.207**	−0.207**
	(−2.352)	(−2.377)	(−2.217)	(−2.280)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.178***	0.248*	−0.348***	−0.421***
	(1.233)	(1.631)	(−2.650)	(−3.133)
Prior Relation	−0.047	−0.040	−0.003	−0.010
	(−0.546)	(−0.456)	(−0.025)	(−0.098)
Number of Rivals	−0.485***	−0.211	0.168	−0.077
	(−3.083)	(−1.118)	(1.007)	(−0.599)
Number of Rivals ∗ Information Gap		−0.030**		0.031*
		(−1.878)		(1.469)
Adjusted R^2	0.346	0.376	0.280	0.311

Panel N: OLS Regressions following Preacher and Hayes (2008)

	Model 1	Model 2	Model 3	Model 4
DV: Information Gap				
Prior Relation	−4.640**	−4.640**	−4.640**	−4.640**
	(−1.836)	(−1.836)	(−1.836)	(−1.836)
DV: Acquisition Target Overpayment (Model 1 and 2)/*Post-Acquisition Performance* (Model 3 and 4)				
Information Gap	0.031***	0.037***	−0.032***	−0.036***
	(2.595)	(3.104)	(−3.038)	(−1.674)
Prior Relation	−0.120	−0.099	−0.005	−0.021
	(−0.465)	(−0.394)	(−0.023)	(−0.101)
Number of Rivals	−0.427***	−0.165	0.115	−0.077
	(−3.307)	(−0.957)	(1.108)	(−0.551)
Number of Rivals ∗ Information Gap		−0.035**		0.026**
		(−2.205)		(2.001)
Adjusted R^2	0.336	0.373	0.291	0.321

***, **, * Significant at the 1 percent, 5 percent, and 10 percent levels, respectively (one-tailed for hypothesized effects; two-tailed for all other effects).